

## POTASSIUM-RICH GLOBULES IN THE LUNA-20 SOIL

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Scanning electron microscopy has revealed the presence of potassium rich globules in the Luna-20 soil. Their size ranges from 1-5 microns and some of them appear to be hollow. They exhibit spherical, elliptical or disc-like shapes. Such objects have not been found in other lunar soils.

### INTRODUCTION

LUNAR soils have been examined microscopically and chemically in great detail. Many peculiar types of particles have been detected which give a clue to the lunar surface chemical and dynamical processes. Here we report the presence of micron size globular grains in the Luna-20 soil, which have potassium as the predominant constituent.

### EXPERIMENTAL METHOD AND RESULTS

Several hundreds of fine luna-16 (L-1629), 20 (L-2020) and 24 (24087, 24123, 24148, 24163) grains were placed on aluminium stubs and examined under a scanning electron microscope at magnifications of up to 50,000. The elements present in some of the peculiar grains were identified with an energy dispersive X-ray analyser attached with the scanning electron microscope. Among these are some globular grains 1-5 $\mu$  in size having elliptical, spherical or disc-like shape which were detected in the Luna-20 sample. Fig. 1 shows three such globules which range in size from 1 to 5 $\mu$ . No such globules have been detected in the other Luna-16 or 24 soils or

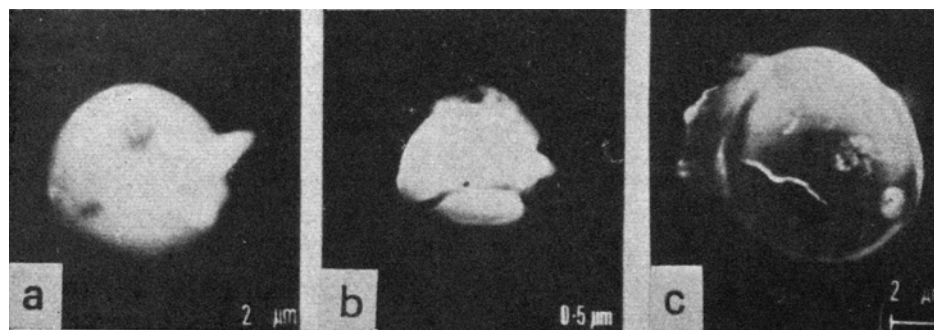


FIG. 1. Potassium rich globules in Luna-20 sample (a) microsphere; (b) a possible cenosphere (hollow sphere) the black spot in the centre being due to the electron beam. The crack can be clearly seen; and (c) a platelet.

Apollo-16 soil (67481, 7) examined here. These microspheres sometimes develop cracks as seen in figure 1b and 1c. The X-ray analysis indicate presence of only potassium in them. Since the detector is not sensitive to elements  $Z < 11$ , the chemical form of K could not be ascertained. Grains physically similar in appearance to these globules occur in Luna-24 and other soils but these were identified as pyroxenes from their chemical composition.

#### DISCUSSION

Amongst various K-rich phases detected in lunar soils are the K-rich siliceous globules (Carter, 1973) which are found to occur as growth features. The K-rich cenospheres and microspheres found here are different from these siliceous globules. Origin of these microspheres is still difficult to ascertain.

#### REFERENCE

- Carter, J. L. (1973). Morphology and chemistry of probable VLS-type whisker structures and other features on the surface of breccia 15015, 36. *Proc. Lunar Sci.*, IV, 413-421.